

TABLE OF CONTENTS

TABLE OF CONTENTS

| | |
|--|------------|
| Executive Summary | E-1 |
| 1.0 Introduction | 1-1 |
| 1.1 Background..... | 1-1 |
| 1.2 Purpose and Need | 1-2 |
| 1.3 EIS Decision Framework..... | 1-2 |
| 1.4 Decisions to Be Made and Implementation Process | 1-2 |
| 1.5 Conformance with BLM Management Plans and Other Laws and Policy Considerations | 1-4 |
| 1.5.1 Consistency with Other Plans, Statutes, and Objectives | 1-4 |
| 1.6 Authorizing Actions..... | 1-5 |
| 1.7 Internal Scoping and Issue Identification..... | 1-10 |
| 2.0 Proposed Action and Alternatives | 2-1 |
| 2.1 Management Actions Common to All Action Alternatives | 2-1 |
| 2.2 Development Activities Common to All Action Alternatives..... | 2-8 |
| 2.2.1 Preconstruction Activities | 2-9 |
| 2.2.2 Proposed Construction Activities..... | 2-9 |
| 2.2.3 WellDrilling..... | 2-16 |
| 2.2.4 Well Completion | 2-17 |
| 2.2.5 Interim Reclamation..... | 2-18 |
| 2.2.6 Production, Operation, Hydraulic Fracturing, and Maintenance Activities..... | 2-19 |
| 2.2.7 Final Reclamation and Abandonment..... | 2-21 |
| 2.2.8 Water Requirements..... | 2-22 |
| 2.2.9 Produced Water Disposal..... | 2-27 |
| 2.2.10 Hazardous Materials and Solid Waste | 2-28 |
| 2.2.11 Adaptive Management Strategy for Potential Adverse Ozone Formation..... | 2-29 |
| 2.2.12 Applicant-Committed Environmental Protection Measures (ACEPMs) | 2-31 |
| 2.3 Alternative A – Proposed Action | 2-38 |
| 2.3.1 Alternative-specific Activities | 2-41 |
| 2.3.2 Well Drilling | 2-44 |
| 2.3.3 Interim Reclamation..... | 2-45 |
| 2.3.4 Water Requirements..... | 2-45 |

| | | |
|-------|---|------|
| 2.3.5 | Produced Water Disposal..... | 2-47 |
| 2.3.6 | Workforce Requirements | 2-47 |
| 2.4 | Alternative B – No Action | 2-48 |
| 2.4.1 | Alternative-specific Activities | 2-52 |
| 2.4.2 | Well Drilling | 2-55 |
| 2.4.3 | Interim Reclamation..... | 2-55 |
| 2.4.4 | Water Requirements..... | 2-55 |
| 2.4.5 | Produced Water Disposal..... | 2-57 |
| 2.4.6 | Workforce Requirements | 2-58 |
| 2.5 | Alternative C – Field-Wide Electrification..... | 2-60 |
| 2.5.1 | Alternative Specific Activities | 2-62 |
| 2.5.2 | Interim Reclamation..... | 2-63 |
| 2.5.3 | Workforce Requirements | 2-63 |
| 2.6 | Alternative D – Resource Protection (Agency Preferred Alternative)..... | 2-64 |
| 2.6.1 | Pariette Wetlands ACEC..... | 2-65 |
| 2.6.2 | Cactus Core Conservation Areas | 2-65 |
| 2.6.3 | New Development Based on Existing Well Density | 2-65 |
| 2.6.4 | Alternative-specific Activities | 2-69 |
| 2.6.5 | Well Drilling | 2-71 |
| 2.6.6 | Interim Reclamation..... | 2-71 |
| 2.6.7 | Water Requirements..... | 2-71 |
| 2.6.8 | Produced Water Disposal..... | 2-73 |
| 2.6.9 | Workforce Requirements | 2-74 |
| 2.7 | Comparison Summary of Impacts Among Alternatives | 2-75 |
| 2.8 | Alternatives Considered but Dismissed from Analysis | 2-79 |

| | | |
|------------|---|------------|
| 3.0 | Affected Environment..... | 3-1 |
| 3.1 | General Setting..... | 3-1 |
| 3.2 | Air Quality | 3-1 |
| 3.2.1 | Climate | 3-2 |
| 3.2.1.1 | Temperature and Precipitation | 3-2 |
| 3.2.1.2 | Winds and Atmospheric Stability | 3-3 |
| 3.2.2 | Regulatory Environment | 3-4 |
| 3.2.2.1 | National Ambient Air Quality Standards | 3-4 |
| 3.2.2.2 | Prevention of Significant Deterioration | 3-5 |
| 3.2.2.3 | New Source Performance Standards..... | 3-6 |
| 3.2.2.4 | Hazardous Air Pollutants | 3-6 |

| | | |
|---------|---|------|
| 3.2.2.5 | Greenhouse Gases | 3-7 |
| 3.2.3 | Existing Air Quality | 3-8 |
| 3.2.3.1 | Existing Sources of Air Pollution | 3-8 |
| 3.2.3.2 | Existing Air Pollutant Monitoring Data | 3-8 |
| 3.3 | Geology and Minerals | 3-11 |
| 3.3.1 | Stratigraphy | 3-11 |
| 3.3.2 | Structure | 3-12 |
| 3.3.3 | Geologic Hazards | 3-12 |
| 3.3.4 | Energy and Mineral Resources | 3-13 |
| 3.3.4.1 | Oil and Natural Gas | 3-13 |
| 3.3.4.2 | Gilsonite | 3-14 |
| 3.3.4.3 | Tar Sands | 3-14 |
| 3.3.4.5 | Other Leasable, Locatable, and Salable Minerals | 3-15 |
| 3.4 | Paleontological Resources | 3-16 |
| 3.4.1 | Regional Overview | 3-16 |
| 3.4.2 | Resource Assessment Guidelines | 3-17 |
| 3.4.3 | Resource Assessment Overview | 3-17 |
| 3.5 | Soils | 3-18 |
| 3.5.1 | Soil Characteristics of Greatest Management Concern | 3-20 |
| 3.5.1.1 | Water Erosion Potential | 3-20 |
| 3.5.1.2 | Wind Erodibility | 3-21 |
| 3.5.1.3 | Available Water Capacity | 3-21 |
| 3.5.1.4 | Rooting Depth | 3-21 |
| 3.5.1.5 | Sodium Adsorption Ratio | 3-22 |
| 3.5.1.6 | Restoration Potential | 3-22 |
| 3.5.1.7 | Biological Soil Crusts | 3-22 |
| 3.6 | Water Resources | 3-23 |
| 3.6.1 | Regional Overview | 3-23 |
| 3.6.2 | Surface Water Resources | 3-23 |
| 3.6.2.1 | MBPA Drainages | 3-23 |
| 3.6.2.2 | Other Water Resources | 3-24 |
| 3.6.2.2 | Surface Water Occurrence | 3-25 |
| 3.6.2.3 | Surface Water Quality | 3-25 |
| 3.6.3 | Groundwater Resources | 3-30 |
| 3.6.3.1 | Occurrence of Groundwater Resources | 3-30 |
| 3.6.3.2 | Recharge/Discharge of Aquifers | 3-31 |

| | | |
|----------|--|------|
| 3.6.3.3 | Groundwater Quality..... | 3-31 |
| 3.7 | Vegetation..... | 3-34 |
| 3.7.1 | General Vegetation | 3-34 |
| 3.7.1.1 | Scrub/Shrub..... | 3-35 |
| 3.7.1.2 | Grassland/Herbaceous..... | 3-36 |
| 3.7.1.3 | Wetlands..... | 3-37 |
| 3.7.1.4 | Barren Lands..... | 3-38 |
| 3.7.1.5 | Altered/Disturbed Lands | 3-39 |
| 3.7.2 | Invasive and Noxious Weeds | 3-40 |
| 3.8 | Range Resources | 3-41 |
| 3.8.1 | Regional Overview | 3-41 |
| 3.8.2 | Grazing Allotments in the MBPA..... | 3-42 |
| 3.9 | Fish and Wildlife..... | 3-43 |
| 3.9.1 | Wildlife Habitats | 3-43 |
| 3.9.2 | General Wildlife..... | 3-44 |
| 3.9.3 | Big Game | 3-44 |
| 3.9.3.1 | Pronghorn Antelope | 3-44 |
| 3.9.4 | Upland Game | 3-47 |
| 3.9.6 | Migratory Birds, Birds of Conservation Concern, and Utah Partners in Flight Priority Bird Species | 3-47 |
| 3.9.6.1 | Intermountain Basins Mat Saltbush Shrubland, Intermountain Basins Mixed Salt Desert Scrub, and Colorado Plateau Pinyon-Juniper Woodland and Shrubland..... | 3-48 |
| 3.9.6.2 | Intermountain Basins Big Sagebrush Shrubland and Colorado Plateau Mixed Low Sagebrush Shrubland..... | 3-48 |
| 3.9.6.3 | Intermountain Basins Shale Badland and Colorado Plateau Mixed Bedrock Canyon and Tableland..... | 3-48 |
| 3.9.7 | Raptors | 3-48 |
| 3.10 | Special Status Species and State Species of COncern | 3-50 |
| 3.10.1 | Federally Threatened, Endangered, or Proposed Species | 3-50 |
| 3.10.1.1 | Fish and Wildlife..... | 3-53 |
| 3.10.1.2 | Plants..... | 3-55 |
| 3.10.2.1 | Fish and Wildlife..... | 3-58 |
| 3.10.2.2 | Plants | 3-64 |
| 3.11 | Cultural Resources | 3-65 |
| 3.11.1 | Area of Potential Effects | 3-66 |
| 3.11.2 | Prehistoric Resources | 3-66 |
| 3.11.3 | Historical Resources | 3-66 |

| | | |
|----------|---|------|
| 3.11.3.1 | Duchesne County | 3-66 |
| 3.11.3.2 | Uintah County | 3-67 |
| 3.11.4 | Regulatory Framework | 3-67 |
| 3.11.5 | Eligibility Criteria for Listing Cultural Resources on the NRHP | 3-67 |
| 3.11.6 | Cultural Resources Investigation Within the MBPA | 3-68 |
| 3.11.6.1 | Prehistoric Sites..... | 3-68 |
| 3.11.6.2 | Historic Sites..... | 3-69 |
| 3.11.6.3 | Multi-Component Sites | 3-70 |
| 3.11.6.4 | NRHP Eligibility of Sites Identified Within the MBPA | 3-72 |
| 3.11.7 | Summary of Cultural Resources | 3-72 |
| 3.12 | Land Use and Transportation..... | 3-72 |
| 3.12.1 | Land Use | 3-72 |
| 3.12.2 | Transportation..... | 3-73 |
| 3.12.2.2 | County Roads..... | 3-75 |
| 3.12.2.3 | BLM System Roads | 3-76 |
| 3.12.2.4 | Right-of-Way and Road Maintenance Responsibility | 3-76 |
| 3.12.2.5 | Dust Control..... | 3-76 |
| 3.13 | Recreation | 3-77 |
| 3.13.1 | Recreation Management | 3-77 |
| 3.13.2 | Recreation Use In ERMAs..... | 3-77 |
| 3.13.2.1 | Recreation Types..... | 3-78 |
| 3.13.2.2 | Off-Highway Vehicles | 3-78 |
| 3.13.2.3 | Hunting and Wildlife Viewing..... | 3-79 |
| 3.13.2.4 | River Recreation | 3-79 |
| 3.13.2.6 | Hiking | 3-80 |
| 3.13.2.7 | Scenic Drives | 3-80 |
| 3.14 | Visual Resources..... | 3-81 |
| 3.14.1 | General Visual Characteristics of the MBPA | 3-81 |
| 3.14.2 | Visual Resource Management System..... | 3-81 |
| 3.14.3 | Visual Resource Management in the MBPA | 3-82 |
| 3.14.4 | Visual Resource Inventory..... | 3-83 |
| 3.15 | Special Designations | 3-85 |
| 3.15.1 | ACECs | 3-85 |
| 3.15.1.1 | Pariette Wetlands ACEC..... | 3-87 |
| 3.15.1.2 | Lower Green River Corridor ACEC | 3-88 |
| 3.15.2 | Wild and Scenic Rivers..... | 3-88 |

| | | |
|----------|--|-------|
| 3.15.3 | Suitable Lower Green River Wild and Scenic River | 3-89 |
| 3.16 | Socioeconomics | 3-89 |
| 3.16.1 | Population, Housing, and Demographics..... | 3-90 |
| 3.16.2 | Employment and Income | 3-91 |
| 3.16.3 | Taxes and Revenues..... | 3-93 |
| 3.16.3.1 | Federal Mineral Lease Royalties..... | 3-93 |
| 3.16.3.2 | State Mineral Lease Royalties..... | 3-94 |
| 3.16.3.3 | Sales and Use Tax Revenue | 3-94 |
| 3.16.3.4 | Severance Tax | 3-94 |
| 3.16.3.5 | Conservation Tax | 3-94 |
| 3.16.3.6 | Property Tax Revenue..... | 3-94 |
| 3.16.3.7 | Surface Use Agreements | 3-95 |
| 3.16.4 | Quality of Living..... | 3-96 |
| 3.16.4.1 | Public Facilities and Services..... | 3-96 |
| 3.16.4.2 | Crime..... | 3-96 |
| 3.16.4.3 | Housing | 3-97 |
| 3.16.5 | Environmental Justice | 3-98 |
| 3.16.6 | Ute Indian Tribe | 3-101 |
| 3.16.6.1 | Demographics | 3-101 |
| 3.16.6.2 | Local Economy and Employment..... | 3-101 |

4.0 Environmental consequences 4-1

| | | |
|---------|--|------|
| 4.1 | Introduction | 4-1 |
| 4.1.2 | Types of Impacts to be Addressed | 4-2 |
| 4.1.2.1 | Unavoidable Adverse Impacts | 4-2 |
| 4.1.2.2 | Irretrievable and Irreversible Commitment of Resources | 4-2 |
| 4.1.2.3 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-3 |
| 4.2 | Air Quality | 4-3 |
| 4.2.1 | Direct and Indirect Effects | 4-4 |
| 4.2.1.1 | Alternative A - Proposed Action..... | 4-4 |
| 4.2.1.2 | Alternative B – No Action Alternative | 4-18 |
| 4.2.1.3 | Alternative C – Field-Wide Electrification | 4-20 |
| 4.2.1.4 | Alternative D – Resource Protection Alternative..... | 4-24 |
| 4.2.2 | Mitigation..... | 4-27 |
| 4.2.3 | Unavoidable Adverse Impacts | 4-27 |
| 4.2.4 | Irretrievable and Irreversible Commitments of Resources | 4-27 |

| | | |
|---------|--|------|
| 4.2.5 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-27 |
| 4.3 | Geology and Minerals..... | 4-27 |
| 4.3.1 | Direct and Indirect Effects | 4-27 |
| 4.3.1.1 | Alternative A – Proposed Action | 4-27 |
| 4.3.1.2 | Alternative B – No Action Alternative | 4-30 |
| 4.3.1.3 | Alternative C – Field-wide Electrification | 4-30 |
| 4.3.1.4 | Alternative D – Resource Protection Alternative..... | 4-30 |
| 4.3.2 | Mitigation..... | 4-31 |
| 4.3.3 | Unavoidable Adverse Impacts | 4-31 |
| 4.3.4 | Irrecoverable and Irreversible Commitments of Resources | 4-31 |
| 4.3.5 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-31 |
| 4.4 | Paleontological Resources | 4-31 |
| 4.4.1 | Direct and Indirect Effects | 4-32 |
| 4.4.1.1 | Alternative A - Proposed Action..... | 4-32 |
| 4.4.1.2 | Alternative B – No Action | 4-33 |
| 4.4.1.3 | Alternative C – Field-Wide Electrification | 4-34 |
| 4.4.1.4 | Alternative D – Resource Protection Alternative..... | 4-34 |
| 4.4.2 | Mitigation..... | 4-34 |
| 4.4.3 | Unavoidable Adverse Impacts | 4-34 |
| 4.4.4 | Irrecoverable and Irreversible Commitments of Resources | 4-35 |
| 4.4.5 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-35 |
| 4.5 | Soils..... | 4-35 |
| 4.5.1 | Direct and Indirect Effects | 4-35 |
| 4.5.1.1 | Alternative A – Proposed Action | 4-35 |
| 4.5.1.2 | Alternative B - No Action Alternative | 4-40 |
| 4.5.1.3 | Alternative C – Field-Wide Electrification | 4-44 |
| 4.5.1.4 | Alternative D – Resource Protection Alternative..... | 4-47 |
| 4.5.2 | Mitigation..... | 4-50 |
| 4.5.3 | Unavoidable Adverse Impacts | 4-51 |
| 4.5.4 | Irrecoverable and Irreversible Commitments of Resources | 4-51 |
| 4.5.5 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-51 |
| 4.6 | Water Resources | 4-51 |
| 4.6.1 | Direct and Indirect Impacts | 4-51 |
| 4.6.1.1 | Alternative A – Proposed Action | 4-52 |
| 4.6.1.2 | Alternative B – No Action | 4-63 |
| 4.6.1.3 | Alternative C – Field-Wide Electrification | 4-69 |

| | | |
|---------|---|-------|
| 4.6.1.4 | Alternative D – Resource Protection..... | 4-76 |
| 4.6.2 | Mitigation..... | 4-82 |
| 4.6.3 | Unavoidable Adverse Impacts | 4-82 |
| 4.6.4 | Irrecoverable and Irreversible Commitments of Resources | 4-82 |
| 4.6.5 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-83 |
| 4.7 | Vegetation..... | 4-83 |
| 4.7.1 | Direct and Indirect Impacts | 4-83 |
| 4.7.1.1 | Alternative A – Proposed Action | 4-83 |
| 4.7.1.2 | Alternative B – No Action Alternative | 4-86 |
| 4.7.1.3 | Alternative C – Field-Wide Electrification | 4-88 |
| 4.7.1.4 | Alternative D – Resource Protection Alternative..... | 4-90 |
| 4.7.2 | Mitigation..... | 4-92 |
| 4.7.3 | Unavoidable Adverse Impacts | 4-93 |
| 4.7.4 | Irrecoverable and Irreversible Commitments of Resources | 4-93 |
| 4.7.5 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-94 |
| 4.8 | Range Resources..... | 4-94 |
| 4.8.1 | Direct and Indirect Effects | 4-95 |
| 4.8.1.1 | Alternative A - Proposed Action..... | 4-95 |
| 4.8.1.2 | Alternative B – No Action Alternative | 4-97 |
| 4.8.1.3 | Alternative C – Field-Wide Electrification | 4-98 |
| 4.8.1.4 | Alternative D – Resource Protection..... | 4-99 |
| 4.8.2 | Mitigation..... | 4-101 |
| 4.8.3 | Unavoidable Adverse Impacts | 4-101 |
| 4.8.4 | Irrecoverable and Irreversible Commitments of Resources | 4-101 |
| 4.8.5 | Relationship of Short-term Uses to Long-term Productivity | 4-102 |
| 4.9 | Fish and Wildlife..... | 4-102 |
| 4.9.1 | Direct and Indirect Impacts | 4-102 |
| 4.9.1.1 | Alternative A – Proposed Action | 4-102 |
| 4.9.1.2 | Alternative B – No Action Alternative | 4-112 |
| 4.9.1.3 | Alternative C – Field-Wide Electrification | 4-115 |
| 4.9.1.4 | Alternative D – Resource Protection..... | 4-119 |
| 4.9.2 | Mitigation..... | 4-123 |
| 4.9.3 | Unavoidable Adverse Impacts | 4-124 |
| 4.9.5 | Relationship of Short-term Uses to Long-Term Productivity | 4-124 |
| 4.10 | Special Status Species and State Species of Concern | 4-124 |
| 4.10.1 | Direct and Indirect Effects | 4-124 |

| | |
|--|-------|
| 4.10.1.1 Alternative A – Proposed Action | 4-125 |
| 4.10.1.2 Alternative B – No Action Alternative | 4-140 |
| 4.10.1.3 Alternative C – Field-wide Electrification..... | 4-147 |
| 4.10.1.4 Alternative D – Resource Protection Alternative..... | 4-154 |
| 4.10.2 Mitigation..... | 4-162 |
| 4.10.2.1 Mitigation Measures for Special Status Raptor Species, Including the Bald Eagle, Golden Eagle, Ferruginous Hawk, Burrowing Owl, Mountain Plover, and Short-eared Owl...4-162 | |
| 4.10.2.2 Mitigation Measures for Colorado River System Endangered and Sensitive Fish | 4-162 |
| 4.10.2.3 Mitigation Measures for Special Status Plant Species, Including the Uinta Basin Hookless Cactus, Pariette Cactus, Ute Ladies’-tresses, Barneby’s Catseye, Graham’s Catseye, and Sterile Yucca | 4-164 |
| 4.10.2.4 Mitigation Measures for the White-Tailed Prairie Dog | 4-168 |
| 4.10.3 Unavoidable Adverse Impacts | 4-169 |
| 4.10.4 Irretrievable and Irreversible Commitments of Resources | 4-169 |
| 4.10.5 Relationship of Short-Term Uses to Long-Term Productivity..... | 4-169 |
| 4.11 Cultural Resources | 4-170 |
| 4.11.1 Direct and Indirect Effects | 4-170 |
| 4.11.1.1 Alternative A - Proposed Action..... | 4-171 |
| 4.11.1.2 Alternative B - No Action Alternative | 4-171 |
| 4.11.1.3 Alternative C - Field-Wide Electrification..... | 4-172 |
| 4.11.1.4 Alternative D – Resource Protection Alternative..... | 4-172 |
| 4.11.2 Section 106 Consultation | 4-172 |
| 4.11.3 Mitigation..... | 4-172 |
| 4.11.4 Unavoidable Adverse Effects..... | 4-172 |
| 4.11.5 Irretrievable and Irreversible Commitments of Resources | 4-173 |
| 4.11.6 Relationship of Short-Term Uses to Long-Term Productivity..... | 4-173 |
| 4.12 Land Use and Transportation..... | 4-173 |
| 4.12.1 Direct and Indirect Effects | 4-174 |
| 4.12.1.1 Alternative A - Proposed Action..... | 4-174 |
| 4.12.1.2 Alternative B - No Action | 4-176 |
| 4.12.1.3 Alternative C - Field-wide Electrification..... | 4-178 |
| 4.12.1.4 Alternative D - Resource Protection | 4-179 |
| 4.12.2 Mitigation..... | 4-180 |
| 4.12.2.1 Transportation Mitigation | 4-180 |
| 4.12.3 Unavoidable Adverse Impacts | 4-181 |
| 4.12.4 Irretrievable and Irreversible Commitments of Resources | 4-181 |
| 4.12.5 Relationship of Short-Term Uses to Long-Term Productivity..... | 4-181 |

| | | |
|----------|---|-------|
| 4.13 | Recreation | 4-182 |
| 4.13.1 | Direct and Indirect Effects | 4-183 |
| 4.13.1.1 | Alternative A - Proposed Action..... | 4-183 |
| 4.13.1.2 | Alternative B - No Action..... | 4-186 |
| 4.13.1.3 | Alternative C – Field-wide Electrification..... | 4-188 |
| 4.13.1.4 | Alternative D - Resource Protection | 4-189 |
| 4.13.2 | Mitigation..... | 4-191 |
| 4.13.3 | Unavoidable Adverse Impacts | 4-191 |
| 4.13.4 | Irrecoverable and Irreversible Commitments of Resources | 4-192 |
| 4.13.5 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-192 |
| 4.14 | Visual Resources..... | 4-192 |
| 4.14.1 | Direct and Indirect Effects | 4-192 |
| 4.14.1.1 | Alternative A - Proposed Action..... | 4-193 |
| 4.14.1.2 | Alternative B - No Action..... | 4-194 |
| 4.14.1.3 | Alternative C – Field-Wide Electrification..... | 4-195 |
| 4.14.1.4 | Alternative D - Resource Protection | 4-195 |
| 4.14.2 | Mitigation..... | 4-196 |
| 4.14.3 | Unavoidable Adverse Impacts | 4-197 |
| 4.14.4 | Irrecoverable and Irreversible Commitments of Resources | 4-197 |
| 4.14.5 | Relationship Of Short-Term Uses To Long-Term Productivity | 4-197 |
| 4.15 | Special Designations | 4-197 |
| 4.15.1 | Direct and Indirect Effects | 4-198 |
| 4.15.1.1 | Alternative A - Proposed Action..... | 4-198 |
| 4.15.1.2 | Alternative B - No Action..... | 4-199 |
| 4.15.1.3 | Alternative C - Field-wide Electrification..... | 4-200 |
| 4.15.1.4 | Alternative D – Resource Protection..... | 4-201 |
| 4.15.2 | Mitigation..... | 4-201 |
| 4.15.3 | Unavoidable Adverse Impacts | 4-202 |
| 4.15.4 | Irrecoverable and Irreversible Commitments of Resources | 4-202 |
| 4.15.5 | Relationship of Short-Term Uses to Long-Term Productivity | 4-203 |
| 4.16 | Socioeconomics | 4-203 |
| 4.16.1 | Direct and Indirect Effects | 4-203 |
| 4.16.1.1 | Alternative A - Proposed Action..... | 4-203 |
| 4.16.1.2 | Alternative B - No Action..... | 4-209 |
| 4.16.1.3 | Alternative C – Field-wide Electrification..... | 4-211 |
| 4.16.1.4 | Alternative D – Resource Protection..... | 4-212 |

| | | |
|------------|--|------------|
| 4.16.2 | Unavoidable Adverse Impacts | 4-213 |
| 4.16.3 | Irrecoverable and Irreversible Commitments of Resources | 4-214 |
| 4.16.4 | Relationship of Short-Term Uses to Long-Term Productivity..... | 4-214 |
| 5.0 | Cumulative Impacts | 5-1 |
| 5.1 | Introduction..... | 5-1 |
| 5.2 | Air Quality | 5-4 |
| 5.2.1 | Criteria Pollutants Other Than Ozone..... | 5-5 |
| 5.2.2 | Hazardous Air Pollutants | 5-5 |
| 5.2.3 | Visual Air Quality..... | 5-6 |
| 5.2.4 | Acid Deposition | 5-6 |
| 5.2.5 | Ozone Concentrations | 5-6 |
| 5.2.6 | Greenhouse Gas Emissions | 5-7 |
| 5.3 | Geology and Minerals..... | 5-9 |
| 5.3.1 | Oil and Gas Exploration, Development, and Production | 5-10 |
| 5.3.2 | Gilsonite..... | 5-11 |
| 5.3.3 | Tar Sands | 5-11 |
| 5.3.4 | Oil Shale..... | 5-13 |
| 5.3.5 | Other Leasable, Locatable, and Salable Minerals | 5-14 |
| 5.4 | Paleontological Resources | 5-14 |
| 5.5 | Soil Resources..... | 5-15 |
| 5.6 | Water Resources | 5-18 |
| 5.7 | Vegetation..... | 5-19 |
| 5.7.1 | General Vegetation | 5-19 |
| 5.7.2 | Invasive and Noxious Weeds | 5-20 |
| 5.8 | Range Resources..... | 5-21 |
| 5.9 | Fish and Wildlife..... | 5-23 |
| 5.10 | Special-Status Plant and Animal Species..... | 5-24 |
| 5.10.1 | Special Status Fish and Wildlife Species | 5-24 |
| 5.10.2 | Special Status Plant Species..... | 5-28 |
| 5.11 | Cultural Resources | 5-32 |
| 5.12 | Land Use and Transportation..... | 5-33 |
| 5.12.1 | Land Use | 5-33 |
| 5.12.2 | Transportation..... | 5-33 |
| 5.13 | Recreation | 5-34 |
| 5.14 | Visual Resources..... | 5-36 |
| 5.15 | Special Designations | 5-38 |

| | |
|---|------------|
| 5.16 Socioeconomics | 5-38 |
| 5.16.1 Socioeconomics | 5-39 |
| 5.16.2 Environmental Justice | 5-42 |
| 6.0 Coordination and Consultation..... | 6-1 |
| 6.1 Introduction..... | 6-1 |
| 6.2 Persons, Groups and Agencies Consulted..... | 6-1 |
| 6.3 Coordination | 6-2 |
| 6.4 Summary of Public Participation | 6-2 |
| 6.5 List of Preparers | 6-4 |
| 7.0 Acronyms, Glossary, and References | 7-1 |
| 7.1 Acronyms and Abbreviations..... | 7-1 |
| 7.2 Glossary of terms | 7-7 |
| 7.3 References..... | 7-33 |

LIST OF TABLES

| | |
|---|------|
| Table 1.1-1. Surface and Oil and Gas Minerals Ownership within the MBPA | 1-1 |
| Table 1.6-1. Key Federal, State, and Local Permits, Approvals, and Authorizing Actions for Construction, Operation, Maintenance, and Abandonment of the Proposed Project1.1-1. Surface and Oil and GasMinerals Ownership within the MBPA..... | 1-6 |
| Table 2.1-1. Regulatory Requirements Common to All Action Alternatives | 2-2 |
| Table 2.2.8-1. Existing Water Supply Sources for the Monument Butte Project..... | 2-25 |
| Table 2.2.8.4-1 Previous USFWS Consultations for Water Usage in the MBPA..... | 2-27 |
| Table 2.3-1. Surface Disturbance under the Proposed Action | 2-40 |
| Table 2.3.4-1. Water Requirements for Well Drilling and Completion, Dust Suppression, and Waterflooding Operations under the Proposed Action | 2-45 |
| Table 2.3.6-1. Estimated Workforce Requirements under the Proposed Action | 2-47 |
| Table 2.4-1. Surface Disturbance under the No Action Alternative | 2-50 |
| Table 2.4-2. Previously Approved and Planned Oil and Natural Gas Development Projects on BLM-Administered Lands in the MBPA under the No Action Alternative | 2-51 |
| Table 2.5-1. Surface Disturbance under Alternative C | 2-61 |
| Table 2.5.1.2-1. Surface Equipment Required for Field-Wide Electrification | 2-63 |
| Table 2.5.3-1. Estimated Workforce Requirements under Alternative C | 2-63 |
| Table 2.6-1. Surface Disturbance under Alternative D | 2-68 |

| | |
|--|------|
| Table 2.6.7-1. Water Requirements for Well Drilling and Completion, Dust Suppression, and Waterflooding Operations under Alternative D | 2-72 |
| Table 2.6.6-1. Estimated Workforce Requirements under Alternative D | 2-74 |
| Table 2.7-1. Design Feature Summary Comparison among Alternatives | 2-76 |
| Table 3.2.1.1-1. Temperature, Precipitation, and Snowfall Data at Myton, Utah..... | 3-3 |
| Table 3.2.2.1-1. National Ambient Air Quality Standards and Prevention of Significant Deterioration (PSD) Class II Increments | 3-5 |
| Table 3.2.3.2-1. Pre-Project Background Ambient Air Quality in the Uinta Basina | 3-9 |
| Table 3.3.4.1-2. Cumulative Oil and Natural Gas Production by Field | 3-14 |
| Table 3.4.3-1. Summarized Paleontological Sensitivities of Geologic Units in the MBPA Using the PFYC System | 3-17 |
| Table 3.5-1. Soil Map Units within the MBPA..... | 3-19 |
| Table 3.6.2.1-1. Subbasin Drainages Within the MBPA | 3-24 |
| Table 3.6.2.3-1. Beneficial Use Designations for Streams in the MBPA | 3-26 |
| Table 3.6.2.3.1-1. Water Quality Standards for Beneficial Uses Pertinent to the MBPA | 3-26 |
| Table 3.6.2.3.2-1. Summary of TMDL Load Reductions in Pariette Draw (STORET Site 4933480) Required for Surface Waters Downstream of the Proposed Project | 3-28 |
| Table 3.6.2.3.2-2. Impaired Streams | 3-28 |
| Table 3.6.3.3-1. Known Groundwater Users in the MBPA | 3-32 |
| Table 3.6.3.3-2. Available Water Quality Data for the MBPA..... | 3-34 |
| Table 3.7.1-1. Vegetation Communities within the MBPA | 3-35 |
| Table 3.7.2-1. Uintah County, Duchesne County, and State of Utah Noxious Weeds | 3-41 |
| Table 3.8.2-1. Livestock Grazing Allotment Information within the MBPA | 3-44 |
| Table 3.9.3.1-1. Summary of Big Game Seasonal Habitats within the MBPA | 3-46 |
| Table 3.9.7-1. Number and Activity Status of Raptor Nests Located within the MBPA..... | 3-50 |
| Table 3.10.1-1. Federally Listed Species Considered for Evaluation in the EIS/BA | 3-52 |
| Table 3.11.6.1-1. Cross Tabulation of Prehistoric Affiliation and Site Type for the MBPA | 3-68 |
| Table 3.11.6.2-1. Cross Tabulation of Historic and/or Ute Affiliation and Site Type for the MBPA..... | 3-70 |
| Table 3.11.6.3-1 Cross Tabulation of Multi-Component Affiliation and Site Type for the MBPA..... | 3-71 |
| Table 3.12.2.1-1. AADT and Percent Truck Traffic for U.S. 40/U.S. 191 Segments That Provide Access to the MBPA | 3-74 |

| | |
|--|-------|
| Table 3.12.2.1-2. Crash History in Duchesne and Uintah Counties, 2008-2010 | 3-75 |
| Table 3.12.2.2-1. County Roads Providing Access to and within the MBPA | 3-76 |
| Table 3.14.2-1. VRM Classes and Objectives..... | 3-82 |
| Table 3.14.3-1. Acreage within the MBPA by VRM Class | 3-83 |
| Table 3.16.1-1. Population Data..... | 3-90 |
| Table 3.16.1-2. Demographic Characteristics of the MBPA, 2010..... | 3-91 |
| Table 3.16.2-1. Non-Agricultural Job Sources in Duchesne and Uintah Counties by Employment Sector, 2010 | 3-91 |
| Table 3.16.2-2. Non-Agricultural Payroll Wages by Employment Sector, 2010..... | 3-93 |
| Table 3.16.3.6-1. Property Taxes Levied on Oil and Gas Exploration and Production within Duchesne and Uintah Counties | 3-95 |
| Table 3.16.4.3-1. Home Sales and Average Prices in the Uinta Basin | 3-98 |
| Table 3.16.5-1. Income and Minority Characteristics of Selected Communities Associated with the MBPA | 3-100 |
| Table 3.16.6.2-1. Job Sources for the Reservation (Ute Indian Tribe) by Employment Sector | 3-102 |
| Table 4.2.1.1.1-1. Proposed Action Ultimate Development Emissions..... | 4-7 |
| Table 4.2.1.1.1-2. Benefit of ACEPMs for NOx and VOC Emissions for the Ultimate Proposed Action | 4-8 |
| Table 4.2.1.1.1-3. Proposed Action Annual Development Emission Increases in the MBPA | 4-9 |
| Table 4.2.1.1.2-1. Alternative A Maximum Potential Construction and Development Impacts | 4-10 |
| Table 4.2.1.1.2-2. Alternative A Maximum Potential Operations Impacts | 4-10 |
| Table 4.2.1.1.3-1. Alternative A Operations HAPs Impacts and Development Phase | 4-11 |
| Table 4.2.1.1.3-2. Alternative A Operational Potential Carcinogenic Risk | 4-12 |
| Table 4.2.1.1.4-1. Alternative A Maximum Impacts at Closest Class I and Sensitive Class II Areas Compared to PSD Increments..... | 4-13 |
| Table 4.2.1.1.4-2. Alternative A Regional Haze Impacts at Closest Class I and Sensitive Class II Areas | 4-13 |
| Table 4.2.1.1.4-3. Alternative A Acid Deposition Impacts at Closest Class I and Sensitive Class II Areas | 4-14 |
| Table 4.2.1.2.1-1. No Action Alternative Emissions | 4-17 |
| Table 4.2.1.3.1-1. Ultimate Development Emissions Under Alternative C (On-site Substations and Electrical Generators) | 4-21 |

| | |
|--|------|
| Table 4.2.1.3.1-2. Ultimate Development Emissions Under Alternative C (Off-site Commercial Source of Electrical Energy) | 4-22 |
| Table 4.2.1.4.1-1. Ultimate Development Emissions Under Alternative D..... | 4-25 |
| Table 4.3.1.1.3-1. Summary of Oil and Natural Gas Resources Extracted by Alternative..... | 4-27 |
| Table 4.4-1. Acreage and Percentage of Land Disturbance by Alternative in PFYC-classified Areas with High Potential to Yield Fossils | 4-31 |
| Table 4.5.1.1-1. Summary of Soil Disturbance by Soil Type for the Proposed Action..... | 4-35 |
| Table 4.5.1.1.1-1. Total Estimated Annual Soil Erosion Under the Proposed Action..... | 4-37 |
| Table 4.5.1.2-1. Summary of Soil Disturbance by Soil Type for Alternative B – No Action | 4-39 |
| Table 4.5.1.2.1-1. Total Estimated Annual Soil Erosion under Alternative B - No Action Alternative | 4-42 |
| Table 4.5.1.3-1. Summary of Soil Disturbance by Soil Type for Alternative C – Field-Wide Electrification | 4-43 |
| Table 4.5.1.3.1-1. Total Estimated Annual Soil Erosion under Alternative C..... | 4-45 |
| Table 4.5.1.4-1. Summary of Soil Disturbance by Soil Type for Alternative D – Resource Protection Alternative | 4-46 |
| Table 4.5.1.4.1-1. Total Estimated Annual Soil Erosion under Alternative D - Resource Protection Alternative | 4-48 |
| Table 4.6.1.1.1.3-1.Water Requirements and Water Availability Under Alternative A – Proposed Action | 4-53 |
| Table 4.6.1.1.1.4-1.Sediment Yield Under Existing Conditions..... | 4-57 |
| Table 4.6.1.1.1.4-2.Sediment Yield During Well Drilling and Completion Phase Under Alternative A – Proposed Action..... | 4-57 |
| Table 4.6.1.1.1.4-3. Sediment Yield During Production Phase Under Alternative A – Proposed Action..... | 4-58 |
| Table 4.6.1.1.1.4-4. Total Sediment Yield Comparison Under Alternative A – Proposed Action..... | 4-58 |
| Table 4.6.1.1.1.5-1. Groundwater Use in Uinta Basin Aquifers | 4-60 |
| Table 4.6.1.2.1.3-1.Water Requirements and Water Availability for Alternative B – No Action..... | 4-63 |
| Table 4.6.1.2.1.4-1. Sediment Yield During Well Drilling and Completion Phase Under Alternative B – No Action | 4-65 |
| Table 4.6.1.2.1.4-2. Sediment Yield During Production Phase Under Alternative B – No Action | 4-65 |
| Table 4.6.1.2.1.4-3. Total Sediment Yield Comparison Under Alternative B – No Action | 4-66 |
| Table 4.6.1.3.1.3-1. Water Requirements and Water Availability for Alternative C – Field-wide Electrification | 4-69 |

| | |
|--|-------|
| Table 4.6.1.3.1.4-1. Sediment Yield During Well Drilling and Completion Phase Under Alternative C – Field-wide Electrification | 4-71 |
| Table 4.6.1.3.1.4-2. Sediment Yield During Production Phase Under Alternative C – Field-wide Electrification | 4-71 |
| Table 4.6.1.3.1.4-3. Total Sediment Yield Comparison Under Alternative C – Field-wide Electrification | 4-71 |
| Table 4.6.1.4.1.3-1. Water Requirements and Water Availability for Alternative D – Resource Protection | 4-74 |
| Table 4.6.1.4.1.4-1. Sediment Yield During Well Drilling and Completion Phase Under Alternative D – Resource Protection | 4-76 |
| Table 4.6.1.4.1.4-2. Sediment Yield During Production Phase Under Alternative D – Resource Protection | 4-77 |
| Table 4.6.1.4.1.4-3. Total Sediment Yield Comparison Under Alternative D – Resource Protection | 4-77 |
| Table 4.7-1 Direct Disturbances to Vegetation Communities by Alternative | 4-80 |
| Table 4.7.1.1-1. Vegetation Communities Affected by Alternative A - Proposed Action | 4-81 |
| Table 4.7.1.2-1. Vegetation Communities Affected by Alternative B - No Action Alternative..... | 4-84 |
| Table 4.7.1.3-1. Vegetation Communities Affected by Alternative C – Field-wide Electrification..... | 4-86 |
| Table 4.7.1.4-1. Vegetation Communities Affected by Alternative D – Resource Protection | 4-88 |
| Table 4.8.1.1-1. Amount of Forage Lost (AUMs) by Grazing Allotment in the MBPA Under Alternative A - Proposed Action..... | 4-93 |
| Table 4.8.1.2-1. Amount of Forage Lost (AUMs) by Grazing Allotment in the MBPA Under Alternative B – No Action Alternative | 4-95 |
| Table 4.8.1.3-1. Amount of Forage Lost (AUMs) by Grazing Allotment in the MBPA Under Alternative C – Field-Wide Electrification..... | 4-96 |
| Table 4.8.1.4-1. Amount of Forage Lost (AUMs) by Grazing Allotment in the MBPA Under Alternative D – Resource Protection | 4-97 |
| Table 4.9.1.1.2-1Direct Disturbances to Suitable Wildlife Habitat by Alternative | 4-100 |
| Table 4.9.1.1.2-1. Surface Disturbances to UDWR-designated Big Game Habitats Under the Proposed Action | 4-102 |
| Table 4.9.1.2.2-1. Surface Disturbances to UDWR-designated Big Game Habitats Under Alternative B - No Action Alternative..... | 4-112 |
| Table 4.9.1.3.2-1. Surface Disturbances to UDWR-designated Big Game Habitats Under Alternative C - Field-Wide Electrification | 4-115 |

| | |
|---|-------|
| Table 4.9.1.4.2-1. Surface Disturbances to UDWR-designated Big Game Habitats Under Alternative D – Resource Protection | 4-118 |
| Table 4.12-1. Surface Disturbance within the MBPA by Surface Owner and Alternative | 4-172 |
| Table 4.12-2. Miles of New Access Road and Surface Disturbance within the MBPA by Surface Owner and Alternative | 4-172 |
| Table 4.12.1.1.2-1. Estimated Vehicle Trips and Miles Traveled within the MBPA by Alternative | 4-174 |
| Table 4.13-1. Long-Term Disturbance from Well Pads and New Roads by Alternative..... | 4-181 |
| Table 4.14-1. Initial Surface Disturbance within the MBPA by VRM Class and Alternative..... | 4-192 |
| Table 4.16.1.1.3-1.Revenue and Expenditures per Well, Uinta Basin..... | 4-203 |
| Table 4.16.1.1.3-2. Maximum Annual Revenue per Alternative..... | 4-203 |
| Table 4.16.1.1.5-1. Potential Environmental Justice Impacts Common to All Action Alternatives | 4-206 |
| Table 5.1-1. Cumulative Impact Analysis Areas | 5-2 |
| Table 5.2.6-1 Global, U.S. and Utah GHG Emissions | 5-8 |
| Table 5.3-1. Surface Disturbance Estimates for Existing, Ongoing, and Pending Oil and Gas Projects in the CIAA for Geology and Minerals, Paleontological Resources, Cultural Resources, and Land Use & Transportation | 5-9 |
| Table 5.3.1-1. Cumulative Oil and Natural Gas Production by Field | 5-11 |
| Table 5.3.3-1. Surface Disturbance Estimates for Impacts to Special Tar Sands Areas from Existing, Ongoing, and Pending Oil and Gas Projects in the CIAA | 5-12 |
| Table 5.3.4-1 Surface Disturbance Estimates for Impacts to Known Oil Shale Lease Areas from Existing, Ongoing, and Pending Oil and Gas Projects in the CIAA | 5-13 |
| Table 5.5-1. Surface Disturbance Estimates for Existing, Ongoing, and Pending Oil and Gas Projects in the CIAA for Soil Resources, Water Resources, Vegetation, Fish & Wildlife, and Special Status Plant, Fish & Wildlife Species (Excluding Uinta Basin Hookless Cactus and Pariette Cactus)..... | 5-16 |
| Table 5.8-1. Surface Disturbance Estimates for Existing, Ongoing, and Pending Oil and Gas Projects in the CIAA for Range Resources..... | 5-21 |
| Table 5.10.2.1-1. Summary of Impacts to Uinta Basin Hookless Cactus and Pariette Cactus Habitat within the CIAA | 5-29 |
| Table 5.13-1. Surface Disturbance Estimates for Existing, Ongoing, and Pending Oil and Gas Projects in the CIAA for Recreation..... | 5-34 |
| Table 5.14-1. Surface Disturbance Estimates for Existing, Ongoing, and Pending Oil and Gas Projects in the CIAA for Visual Resources | 5-37 |
| Table 6.5-1. List of BLM Preparers | 6-4 |

| | | |
|--------------|---------------------------------|-----|
| Table 6.5-2. | List of Non-BLM Preparers | 6-5 |
|--------------|---------------------------------|-----|

LIST OF FIGURES

- Figure 1. Drilling and Production Pad Layout
- Figure 1.1-1. Monument Butte Project Area
- Figure 2-1. Alternative A
- Figure 2-2. Alternative B
- Figure 2-3. Alternative C
- Figure 2-4. Alternative D
- Figure 2.1.2.4-1. Typical Cross Country Pipeline Installation Scenarios with Width Specifications
- Figure 2.2.2.1-1. Typical Single Well Pad Layout
- Figure 2.2.2.3-1. Typical Roadway Cross Section with Width Specifications
- Figure 2.2.2.3-2. Typical Roadway Cross Section with Pipeline Installation Along Side Road
- Figure 2.2.2.5-1. Typical Compressor Station Layout
- Figure 2.2.2.8-1. Typical Gas and Oil Separation Plant Layout.
- Figure 2.2.3-1. Example Well Bore Diagram
- Figure 2.2.8.3-1. Example Water Collector Well
- Figure 2.3-1. Active, Inactive, and Future Wells
- Figure 2.6-2. Comparison of a Typical Section
- Figure 2.6-1. . Well Pad Density by Section
- Figure 3.2.1.2-1. Wind Rose from Vernal Data 2005-2009
- Figure 3.3.1-1. Surficial Geology within the MBPA
- Figure 3.3.1-2. Geographic History and Stratigraphy of the Uinta Basin Region
- Figure 2.3.4.1-1. Oil and Gas Fields and Potential Mineral Areas within the Uinta Basin
- Figure 3.3.4.1-2. Potential Tar Sands and Oil Shale Areas
- Figure 3.5-1. Soil Map Units within the MBPA
- Figure 3.6.2.1-1. Drainage Basins
- Figure 3.6.2.3-1. Impaired Streams
- Figure 3.6.3.2-1. Surface Water and Floodplains
- Figure 3.7.1-1. . Vegetation Communities within the MBPA
- Figure 3.8.2-1. Grazing Lots
- Figure 3.9.3.1-1. Pronghorn Antelope Seasonal Ranges
- Figure 3.9.3.2-1. Mule Deer Seasonal Ranges
- Figure 3.9.3.3-1. Elk Seasonal Ranges
- Figure 3.10.1.2-1. Potential Cactus Habitat and Core Conservation Areas
- Figure 3.10.2.1.4-1. Prairie Dog Colonies

- Figure 3.10.2.1.12-1. Mountain Plover Habitat
Figure 3.21.2-1. MBPA Roadway System
Figure 3.13.1-1. SRMAs in the Vicinity of the MBPA
Figure 3.13.2.2-1. OHV Areas in the Vicinity of the MBPA
Figure 3.14.3-1. VRM Classes within the Vicinity of the MBPA
Figure 3.15-1. Special Designations
Figure 5.1-1. Past, Current, and Reasonably Foreseeable Actions
Figure 5.1-2. Cumulative Impact Analysis Areas
Figure 5.16.1.1-1. Projected Natural Gas Production in the Mountain Region

APPENDICES

| | |
|--|-----|
| Appendix A. ID Team Checklist..... | A-1 |
| Appendix B. Air Quality Technical Support | B-1 |
| Appendix C. Soil Units | C-1 |
| Appendix D. Special Status Plants..... | D-1 |
| Appendix E. Special Status Fish and Wildlife | E-1 |
| Appendix F. Soil and Water Resources | F-1 |
| Appendix G. Reclamation Plan..... | G-1 |
| Appendix H. Water Quality Monitoring Plan | H-1 |